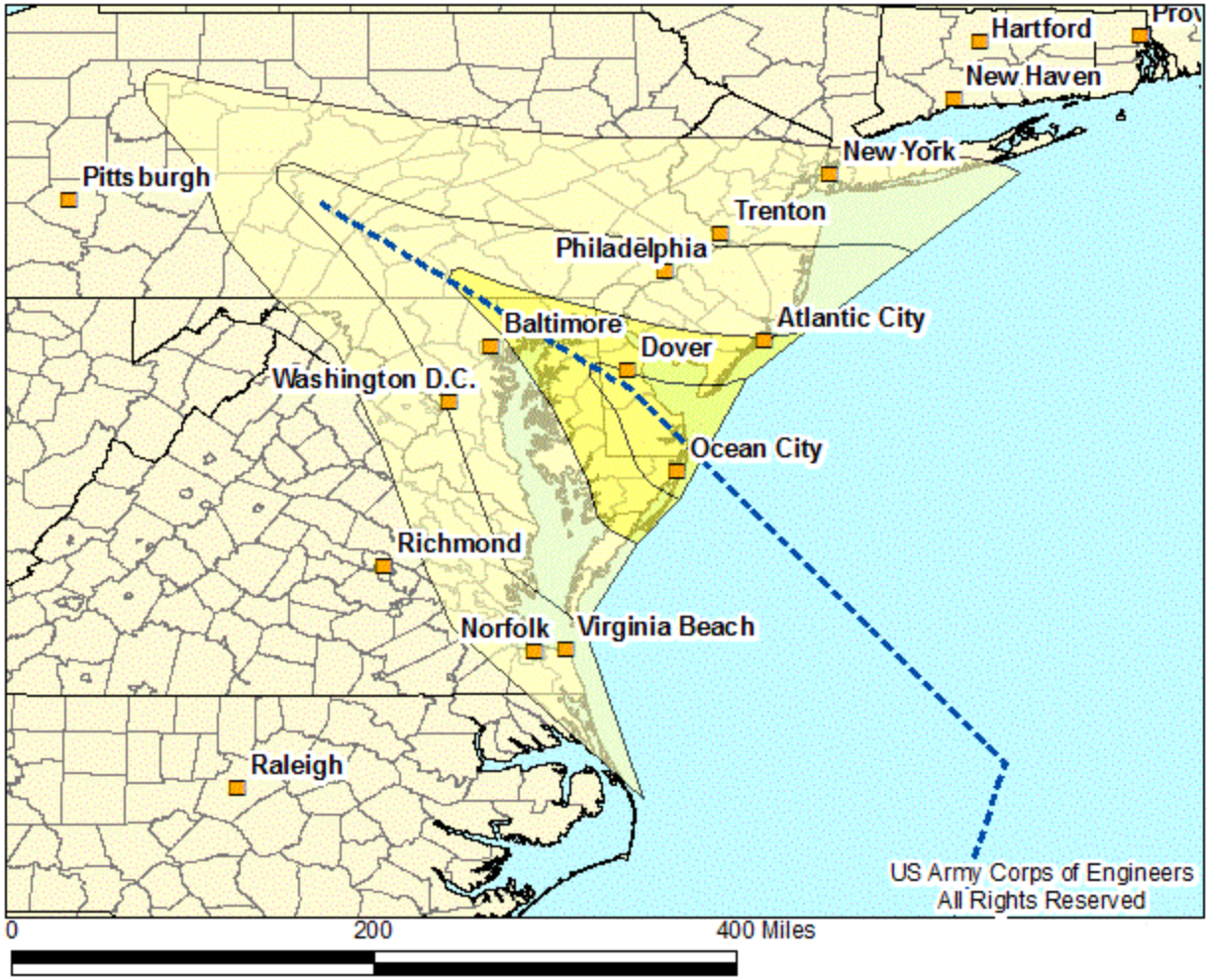
Hurricane Sandy Projected Damage Areas

US Army Corps of Engineers

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Post Landfall Projected Damage Areas

This model is based on a Category 1 storm making landfall coastal DE.

Forecast Track

Projected Damage Areas

- CAT 0-type damage
- CAT 1-type damage
- CAT 2-type damage
- CAT 3-type damage
- CAT 4-type damage
- CAT 5-type damage

Information provided on this page displays a projected or actual Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast and extrapolated by LRL staff to represent a landfall condition that has either occurred or may occur in the near future.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Projected Damage Areas

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

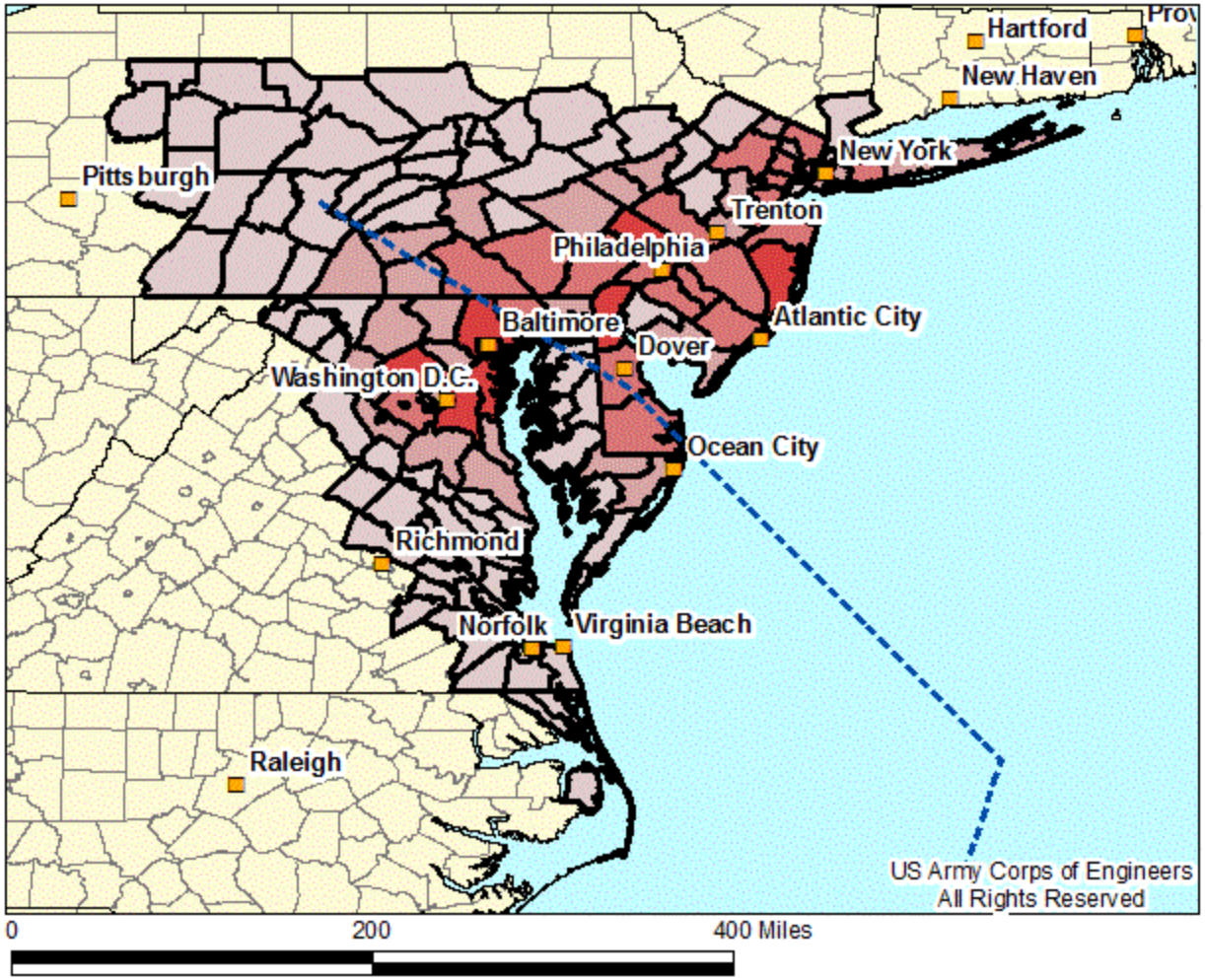
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Debris Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Post Landfall Debris Model Results

Maryland - 5,553,000 Yards
New Jersey - 5,488,000 Yards
Pennsylvania - 5,134,000 Yards
Virginia - 1,734,000 Yards
Delaware - 1,394,000 Yards
New York - 1,378,000 Yards
District of Columbia - 215,000 Yards
West Virginia - 63,000 Yards
North Carolina - 31,000 Yards

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

Forecast Track

Debris

- < 100,000 cubic yards
- 100,000 - 249,999 cubic yards
- 250,000 - 499,999 cubic yards
- 500,000 - 999,999 cubic yards
- >1,000,000 cubic yards

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast. The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Debris Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Debris Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!

State	Yards per State	County	Yards per County
Delaware		Kent County	288,000
		New Castle County	615,000
		Sussex County	491,000
Delaware	1,394,000		
District of Columbia		District of Columbia	215,000
District of Columbia	215,000		
Maryland		Anne Arundel County	686,000
		Baltimore County	741,000
		Baltimore city	736,000
		Calvert County	117,000
		Caroline County	54,000
		Carroll County	167,000
		Cecil County	157,000
		Charles County	114,000
		Dorchester County	57,000
		Frederick County	143,000
		Harford County	412,000
		Howard County	244,000
		Kent County	35,000
		Montgomery County	555,000
		Prince George's County	650,000
		Queen Anne's County	67,000
		Somerset County	39,000
		St. Mary's County	179,000
		Talbot County	67,000
		Washington County	82,000
		Wicomico County	132,000
		Worcester County	119,000
Maryland	5,553,000		

State	Yards per State	County	Yards per County
New Jersey		Atlantic County	307,000
		Bergen County	319,000
		Burlington County	424,000
		Camden County	487,000
		Cape May County	208,000
		Cumberland County	221,000
		Essex County	309,000
		Gloucester County	282,000
		Hudson County	211,000
		Hunterdon County	70,000
		Mercer County	194,000
		Middlesex County	383,000
		Monmouth County	320,000
		Morris County	261,000
		Ocean County	672,000
		Passaic County	199,000
		Salem County	79,000
		Somerset County	179,000
		Sussex County	20,000
		Union County	283,000
		Warren County	60,000
New Jersey	5,488,000		
New York		Bronx County	91,000
		Kings County	225,000
		Nassau County	422,000
		New York County	94,000
		Queens County	151,000
		Richmond County	87,000

The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

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Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Debris Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Debris Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!

State	Yards per State	County	Yards per County
New York		Suffolk County	226,000
(continued)		Westchester County	82,000
New York	1,378,000		
North Carolina		Camden County	2,000
		Currituck County	15,000
		Dare County	14,000
North Carolina	31,000		
Pennsylvania		Adams County	105,000
		Bedford County	30,000
		Berks County	211,000
		Blair County	72,000
		Bucks County	309,000
		Cambria County	36,000
		Cameron County	< 1,000
		Carbon County	33,000
		Centre County	89,000
		Chester County	422,000
		Clarion County	6,000
		Clearfield County	63,000
		Clinton County	21,000
		Columbia County	22,000
		Cumberland County	153,000
		Dauphin County	180,000
		Delaware County	370,000
		Elk County	6,000
		Forest County	3,000
		Franklin County	121,000
		Fulton County	10,000
		Huntingdon County	53,000

State	Yards per State	County	Yards per County
Pennsylvania		Indiana County	5,000
(continued)		Jefferson County	28,000
		Juniata County	17,000
		Lancaster County	359,000
		Lebanon County	79,000
		Lehigh County	158,000
		Luzerne County	31,000
		Lycoming County	3,000
		Mifflin County	31,000
		Monroe County	36,000
		Montgomery County	557,000
		Montour County	9,000
		Northampton County	137,000
		Northumberland County	48,000
		Perry County	40,000
		Philadelphia County	807,000
		Schuylkill County	81,000
		Snyder County	19,000
		Somerset County	< 1,000
		Union County	19,000
		York County	355,000
Pennsylvania	5,134,000		
Virginia		Accomack County	54,000
		Alexandria city	76,000
		Arlington County	109,000
		Caroline County	6,000
		Charles City County	2,000
		Chesapeake city	73,000

The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

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Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Debris Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Debris Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!

State	Yards per State	County	Yards per County
Virginia		Essex County	9,000
(continued)		Fairfax County	290,000
		Fairfax city	16,000
		Falls Church city	11,000
		Fauquier County	< 1,000
		Gloucester County	28,000
		Hampton city	79,000
		Hanover County	2,000
		Isle of Wight County	19,000
		James City County	56,000
		King George County	15,000
		King William County	9,000
		King and Queen County	6,000
		Lancaster County	19,000
		Loudoun County	113,000
		Manassas Park city	9,000
		Manassas city	25,000
		Mathews County	11,000
		Middlesex County	14,000
		New Kent County	10,000
		Newport News city	92,000
		Norfolk city	81,000
		Northampton County	15,000
		Northumberland County	20,000
		Poquoson city	8,000
		Portsmouth city	73,000
		Prince George County	< 1,000
		Prince William County	158,000
		Richmond County	7,000
		Spotsylvania County	< 1,000
		Stafford County	39,000

State	Yards per State	County	Yards per County
Virginia		Suffolk city	22,000
(continued)		Surry County	5,000
		Virginia Beach city	89,000
		Westmoreland County	17,000
		Williamsburg city	9,000
		York County	39,000
Virginia	1,735,000		
West Virginia		Berkeley County	42,000
		Jefferson County	16,000
		Morgan County	5,000
West Virginia	63,000		

The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

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Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Debris Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

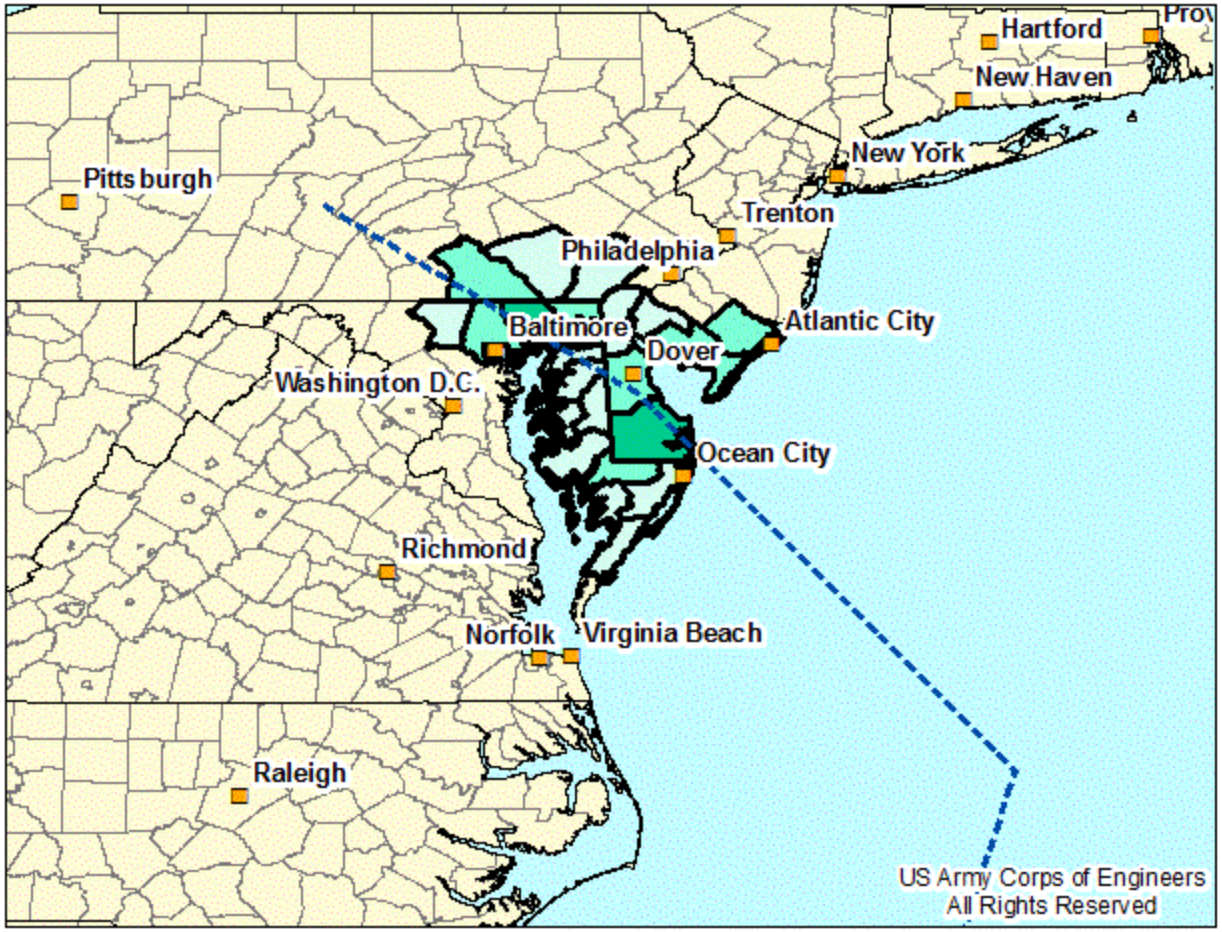
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Commodities Model

Landfall Expected In About **84** Hours

For Planning Purposes Only!



Post Landfall Water Model Results

Day One / Day Two / Day Three

Maryland – 13/26/51 Truckloads
Delaware – 7/13/26 Truckloads
New Jersey – 6/12/23 Truckloads
Pennsylvania – 2/4/8 Truckloads
Virginia – 1/1/1 Truckloads

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

Forecast Track

Commodities

- < 5 Trucks Each
- 5 - 10 Trucks Each
- 11 - 20 Trucks Each
- 21 - 40 Trucks Each
- > 40 Trucks Each

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC ***(1430 EDT 10/26/2012)*** forecast. The amount of commodities forecasted is based on Mission Guide Book requirements and SME input. The graphic represents daily needs with a ramp-up in the distribution system – three days for Points of Distribution (PODs) to be fully in place and operational. Volume shown is for each commodity – water and ice. Commodity need may be supplied by multiple agencies and/or sources.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Commodities Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Commodities Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!

State	Truckloads per State	County	Truckloads per County
Delaware		Kent County	10
		New Castle County	4
		Sussex County	12
Delaware	26		
Maryland		Baltimore County	9
		Caroline County	2
		Carroll County	1
		Cecil County	5
		Dorchester County	1
		Harford County	15
		Kent County	2
		Queen Anne's County	2
		Somerset County	2
		Talbot County	2
		Wicomico County	6
		Worcester County	4
Maryland	51		
New Jersey		Atlantic County	10
		Cape May County	6
		Cumberland County	6
		Salem County	1
New Jersey	23		
Pennsylvania		Chester County	1
		Lancaster County	1
		York County	6
Pennsylvania	8		
Virginia		Accomack County	1
Virginia (continued)	1		

Source: US Army Corps of Engineers, All Rights Reserved

The amount of commodities forecasted is based on Mission Guide Book requirements and SME input and the above table indicates suggested daily needs based on full deployment of a commodities distribution system. Volume shown is for each commodity – water and ice. Commodity need may be supplied by multiple agencies and/or sources.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Commodities Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

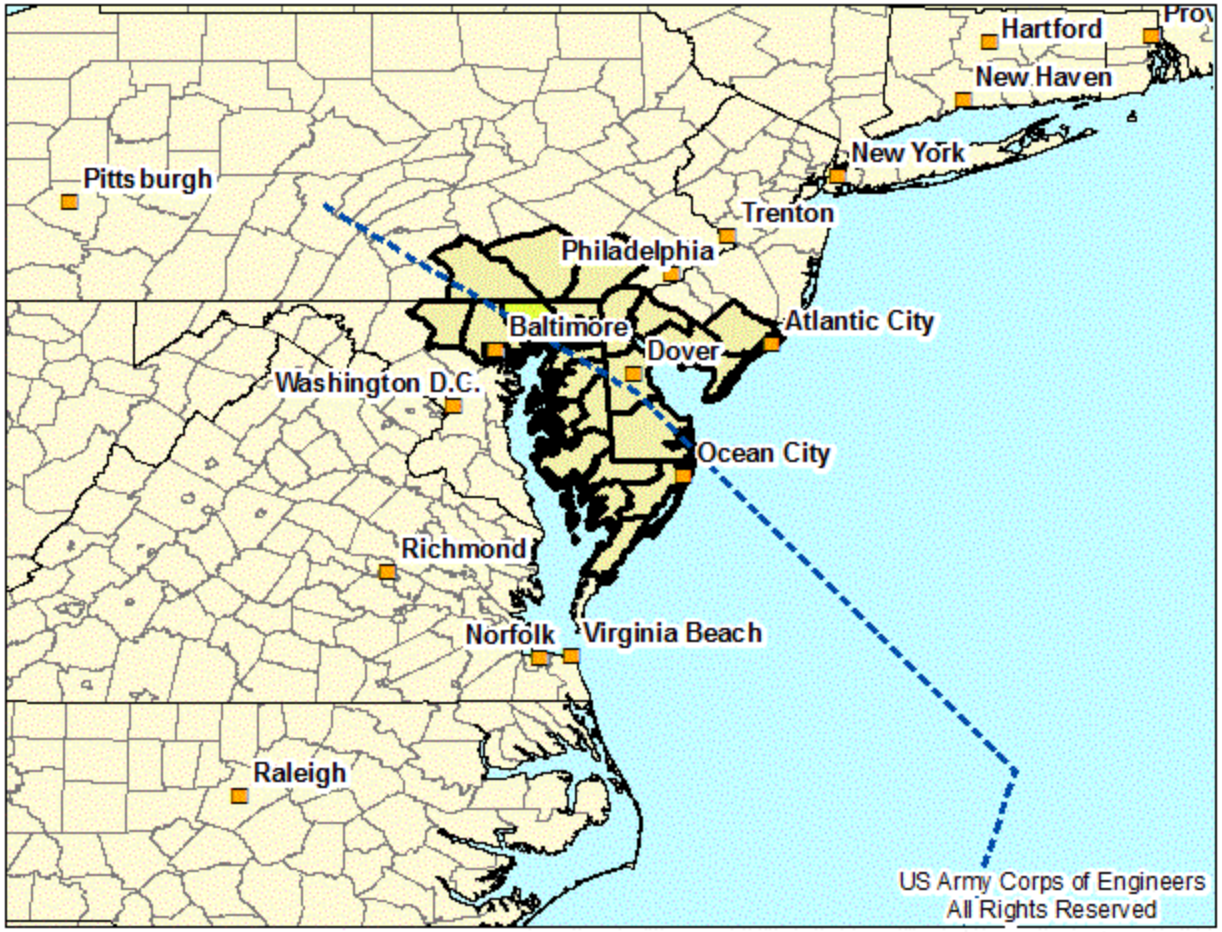
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Temporary Roofing Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Post Landfall Temporary Roofing Model Results

Maryland - 7,600
Delaware - 3,700
New Jersey - 3,200
Pennsylvania - 900
Virginia - 200

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

Forecast Track

Temporary Roofing

- < 2,000 units
- 2,000 - 3,999 units
- 4,000 - 5,999 units
- 6,000 - 9,999 units
- > 10,000 units

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast. Temporary roofing is based on 3% in CAT 1.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Roofing Model	
Generated By: Siemsen, Keown, LRL 1500 EDT 10/26/2012	
Sources: HURREVAC LRL-DEBRIS	Page 8 of 18

US Army Corps of Engineers

Hurricane Sandy Temporary Roofing Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!

State	House Units per State	County	House Units per County
Delaware		Kent County	1,500
		New Castle County	500
		Sussex County	1,700
Delaware	3,700		
Maryland		Baltimore County	1,300
		Caroline County	400
		Carroll County	< 100
		Cecil County	800
		Dorchester County	200
		Harford County	2,200
		Kent County	300
		Queen Anne's County	300
		Somerset County	200
		Talbot County	300
		Wicomico County	900
		Worcester County	700
Maryland	7,600		
New Jersey		Atlantic County	1,400
		Cape May County	1,000
		Cumberland County	800
		Salem County	< 100
New Jersey	3,200		
Pennsylvania		Chester County	< 100
		Lancaster County	< 100
		York County	900
Pennsylvania	900		
Virginia		Accomack County	200

State	House Units per State	County	House Units per County
Virginia (continued)	200		

Temporary roofing is based on 3% in CAT 1.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Roofing Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

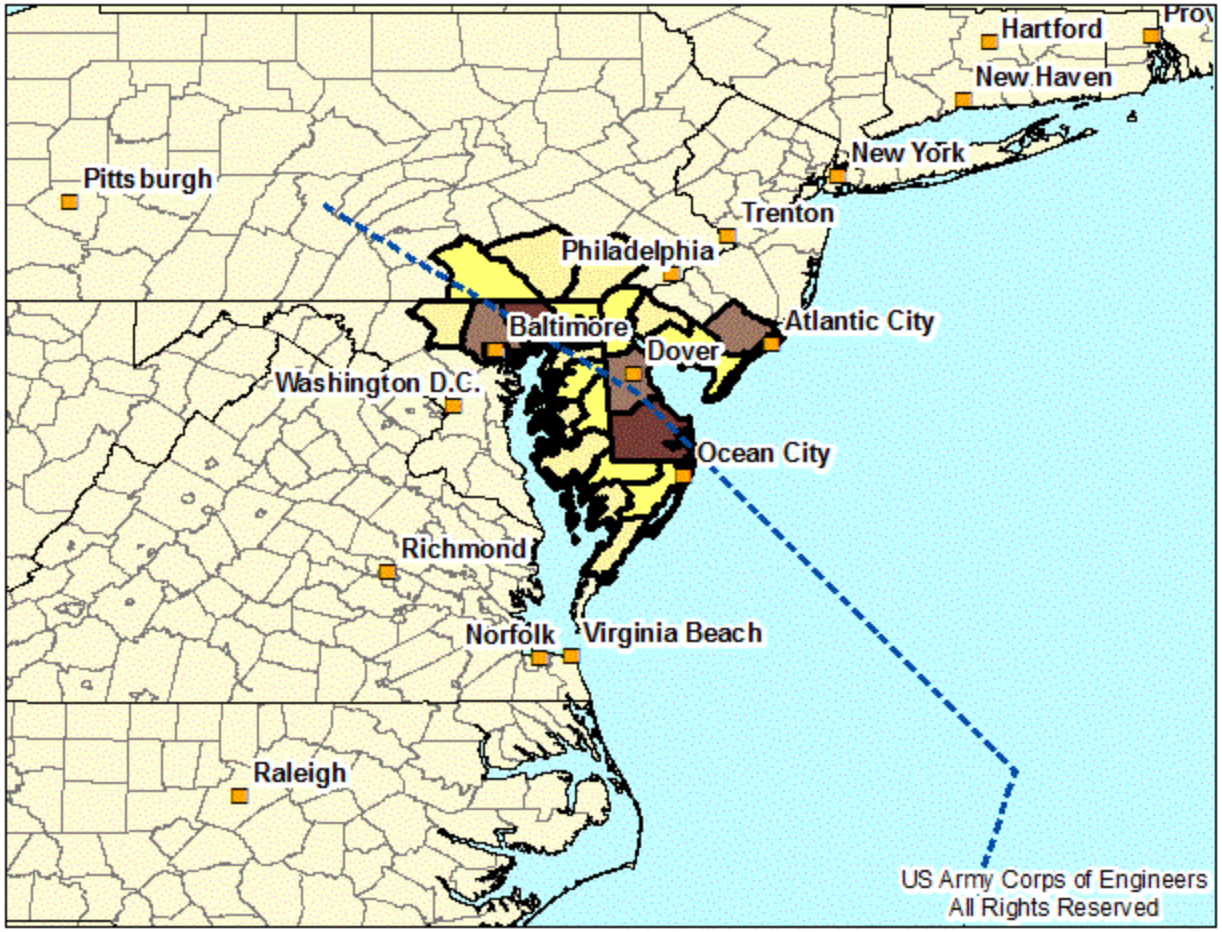
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Population Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Post Landfall Population Model Results

Maryland - 768,000
Delaware - 428,000
New Jersey - 364,000
Pennsylvania - 89,000
Virginia - 15,000

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

Forecast Track

Population

- < 25,000 persons
- 25,000 - 99,999 persons
- 100,000 - 174,999 persons
- 175,000 - 249,999 persons
- > 250,000 persons

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast. The numbers of persons included in this model output are those that would be included within estimated hurricane force winds (Census 2010 values adjusted to July 2011 values).

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Population Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Population Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!

State	Population per State	County	Population per County
Delaware		Kent County	165,000
		New Castle County	62,000
		Sussex County	201,000
Delaware	428,000		
Maryland		Baltimore County	152,000
		Caroline County	33,000
		Carroll County	< 1,000
		Cecil County	84,000
		Dorchester County	13,000
		Harford County	247,000
		Kent County	21,000
		Queen Anne's County	26,000
		Somerset County	19,000
		Talbot County	22,000
		Wicomico County	99,000
		Worcester County	52,000
Maryland	768,000		
New Jersey		Atlantic County	164,000
		Cape May County	97,000
		Cumberland County	99,000
		Salem County	4,000
New Jersey	364,000		
Pennsylvania		Chester County	< 1,000
		Lancaster County	< 1,000
		York County	89,000
Pennsylvania	89,000		
Virginia		Accomack County	15,000

State	Population per State	County	Population per County
Virginia (continued)	15,000		

The number of persons estimated to be within the hurricane force winds comes from Census 2010 values adjusted to July 2011 values.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Population Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

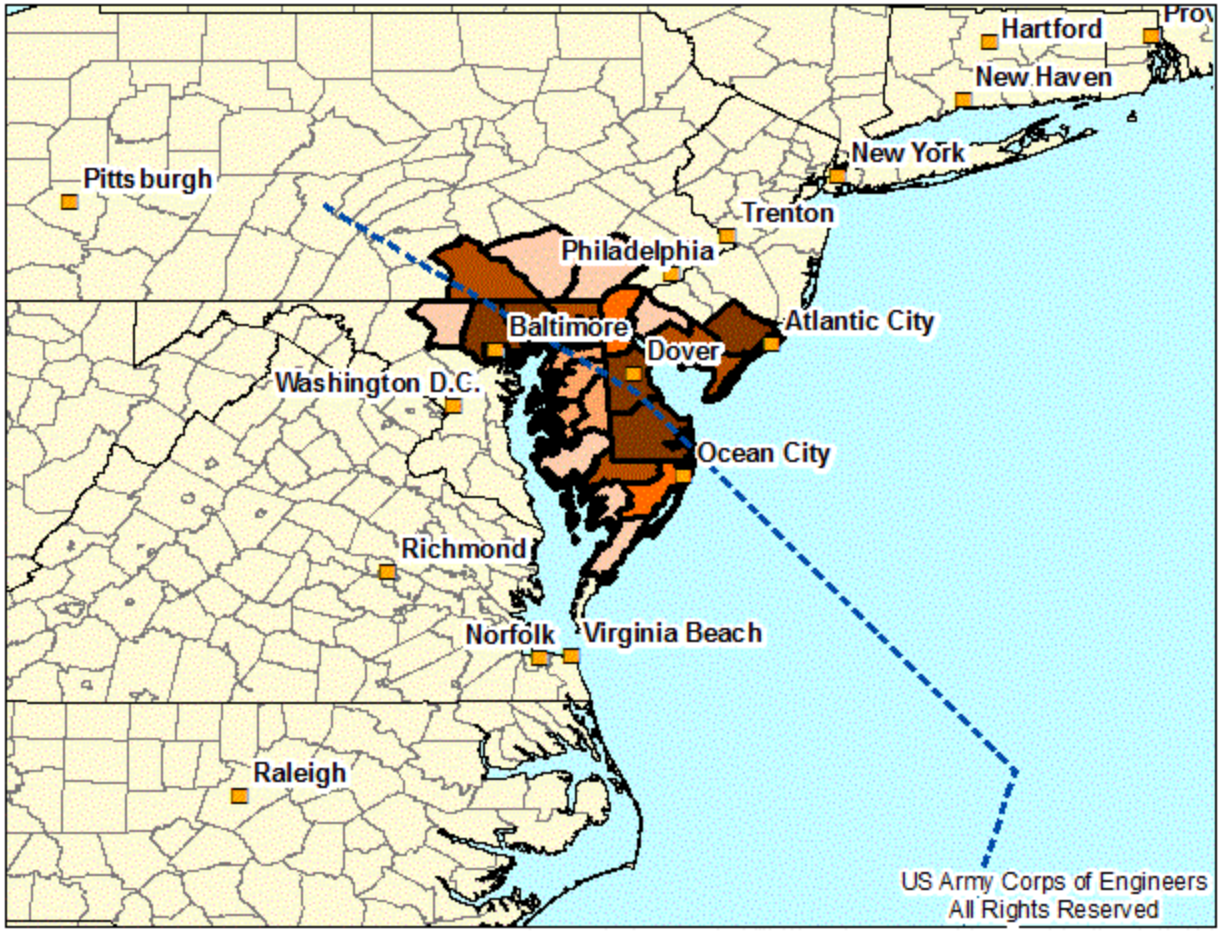
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Households Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Post Landfall Households Model Results

Maryland - 292,000
Delaware - 164,000
New Jersey - 139,000
Pennsylvania - 34,000
Virginia - 6,000

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

Forecast Track

Households

- < 7,500 households
- 7,500 - 14,999 households
- 15,000 - 24,999 households
- 25,000 - 49,999 households
- > 50000 households

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast. The numbers of households included in this model output are those that would be included within estimated hurricane force winds (Census 2010 values adjusted to July 2011 values).

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Households Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Households Model

Landfall Expected In About 84 Hours

For Planning Purposes Only!

State	Households per State	County	Households per County
Delaware		Kent County	62,000
		New Castle County	21,000
		Sussex County	81,000
Delaware	164,000		
Maryland		Baltimore County	59,000
		Caroline County	13,000
		Carroll County	< 1,000
		Cecil County	31,000
		Dorchester County	5,000
		Harford County	90,000
		Kent County	9,000
		Queen Anne's County	10,000
		Somerset County	6,000
		Talbot County	9,000
		Wicomico County	38,000
		Worcester County	22,000
Maryland	292,000		
New Jersey		Atlantic County	64,000
		Cape May County	40,000
		Cumberland County	33,000
		Salem County	2,000
New Jersey	139,000		
Pennsylvania		Chester County	< 1,000
		Lancaster County	< 1,000
		York County	34,000
Pennsylvania	34,000		
Virginia		Accomack County	6,000

State	Households per State	County	Households per County
Virginia	6,000		
(continued)			

The number of households estimated to be within the hurricane force winds comes from Census 2010 values adjusted to July 2011 values.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Households Model

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

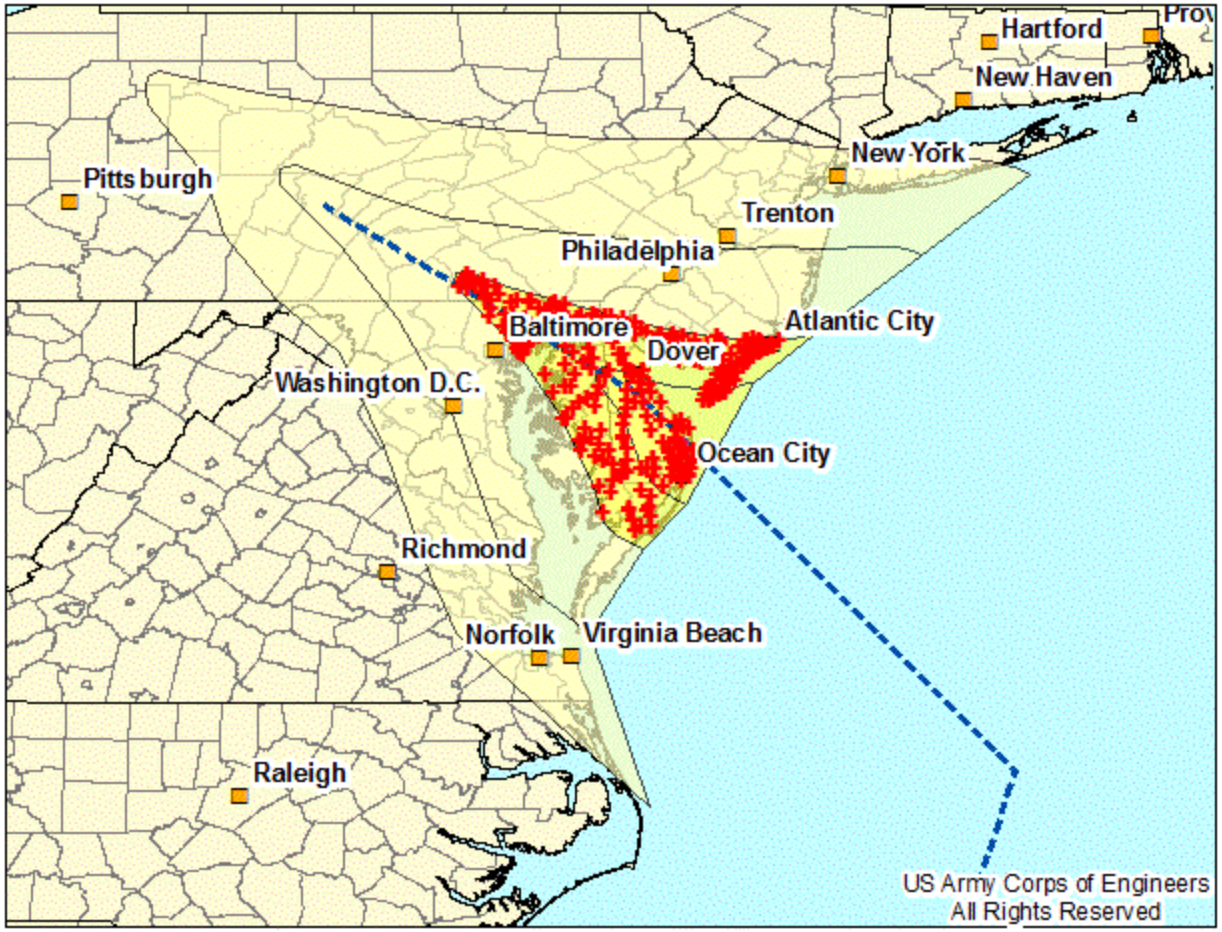
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Fire Stations

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Most Probable Landfall Fire Stations Inside Hurricane Force Winds

Maryland - 122
New Jersey - 90
Delaware - 59
Pennsylvania - 18
Virginia - 5

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

\+ Fire Stations
Forecast Track

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast.

The number of fire stations included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

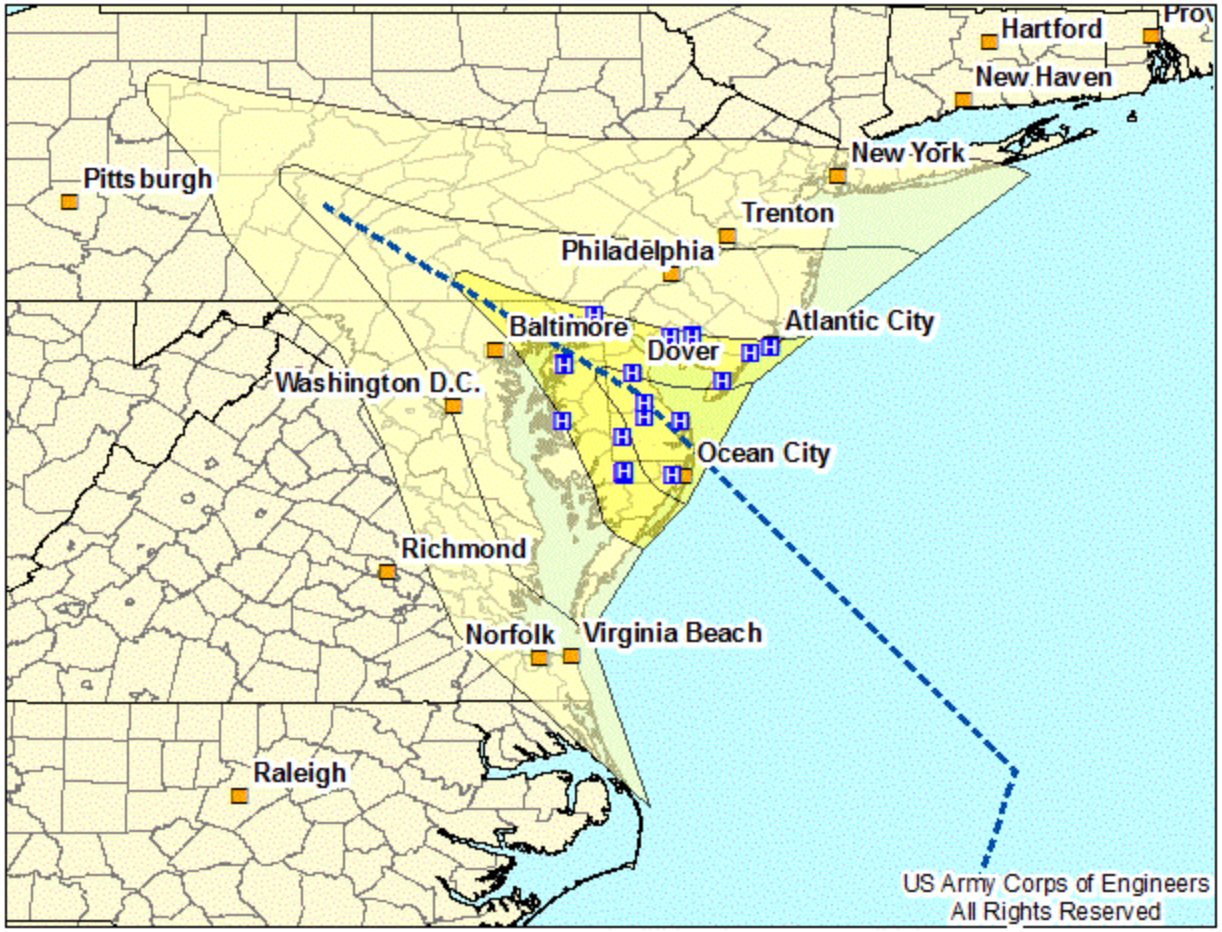
Hurricane Sandy Fire Stations	
Generated By: Siemsen, Keown, LRL 1500 EDT 10/26/2012	
Sources: HURREVAC LRL-DEBRIS	Page 14 of 18

US Army Corps of Engineers

Hurricane Sandy Hospitals

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Most Probable Landfall Hospitals Inside Hurricane Force Winds

Maryland - 12
New Jersey - 8
Delaware - 5

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

H Hospitals
Forecast Track

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast.

The number of hospitals included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

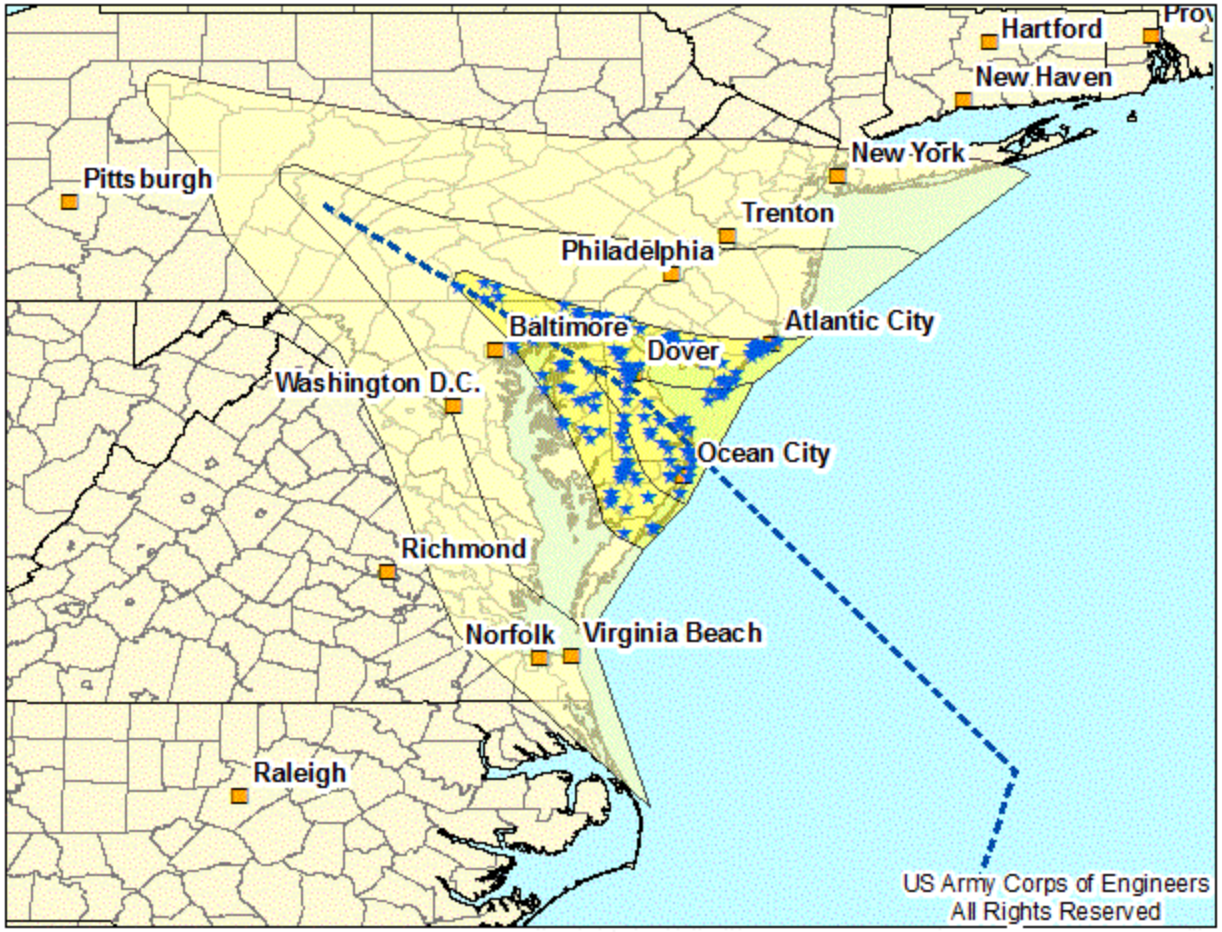
Hurricane Sandy Hospitals	
Generated By: Siemsen, Keown, LRL 1500 EDT 10/26/2012	
Sources: HURREVAC LRL-DEBRIS	

US Army Corps of Engineers

Hurricane Sandy Law Enforcement

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Most Probable Landfall Law Enforcement Inside Hurricane Force Winds

Maryland - 74
New Jersey - 47
Delaware - 46
Pennsylvania - 5
Virginia - 4

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

★ Law Enforcement
Forecast Track

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast.

The number of law enforcement included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

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Hurricane Sandy Law Enforcement	
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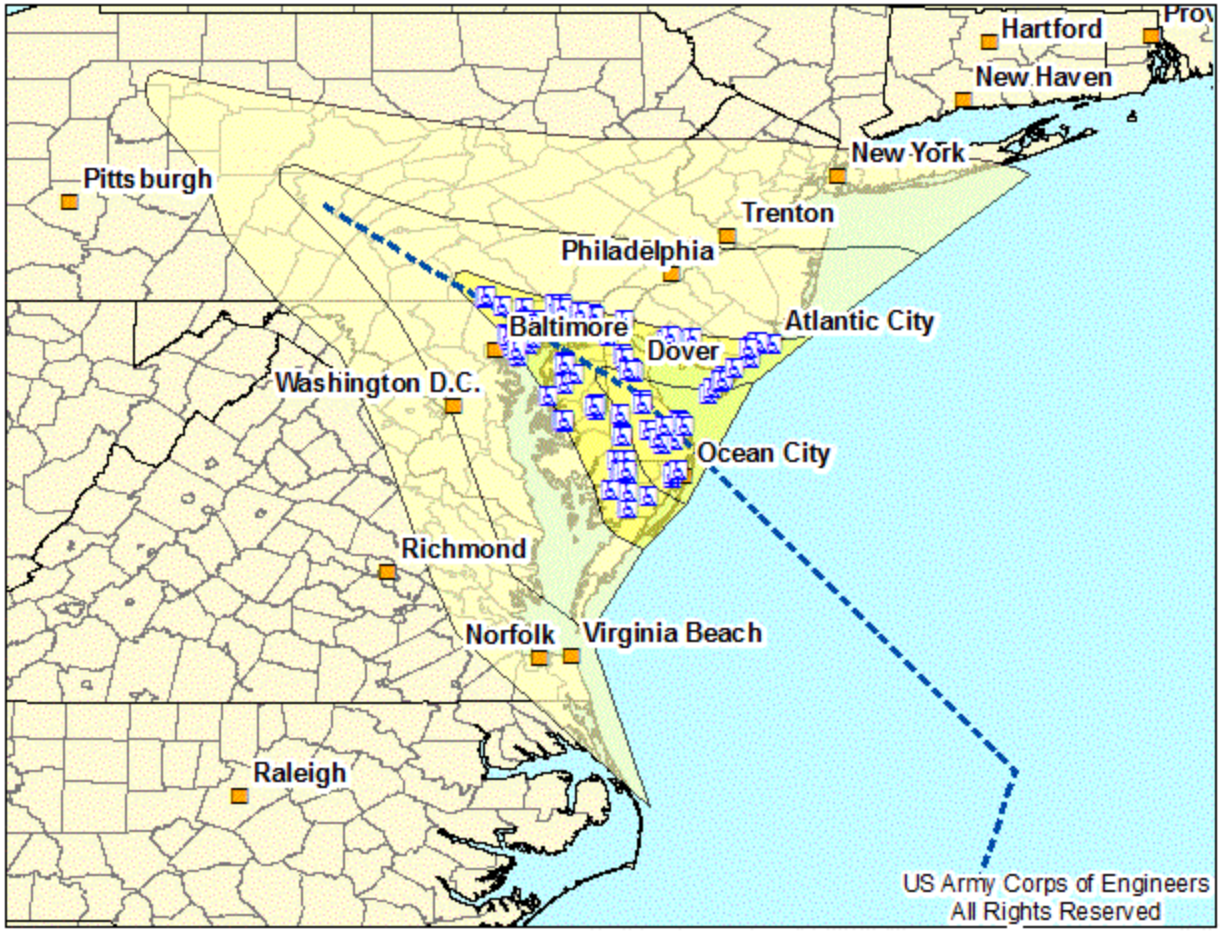
Sources: HURREVAC LRL-DEBRIS	Page 16 of 18

US Army Corps of Engineers

Hurricane Sandy Nursing Homes

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Most Probable Landfall Nursing Homes Inside Hurricane Force Winds

Maryland - 86
Delaware - 34
New Jersey - 23
Pennsylvania - 3

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

Nursing Homes
Forecast Track

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast.

The number of nursing homes included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Nursing Homes

Generated By:
Siemsen, Keown, LRL 1500 EDT 10/26/2012

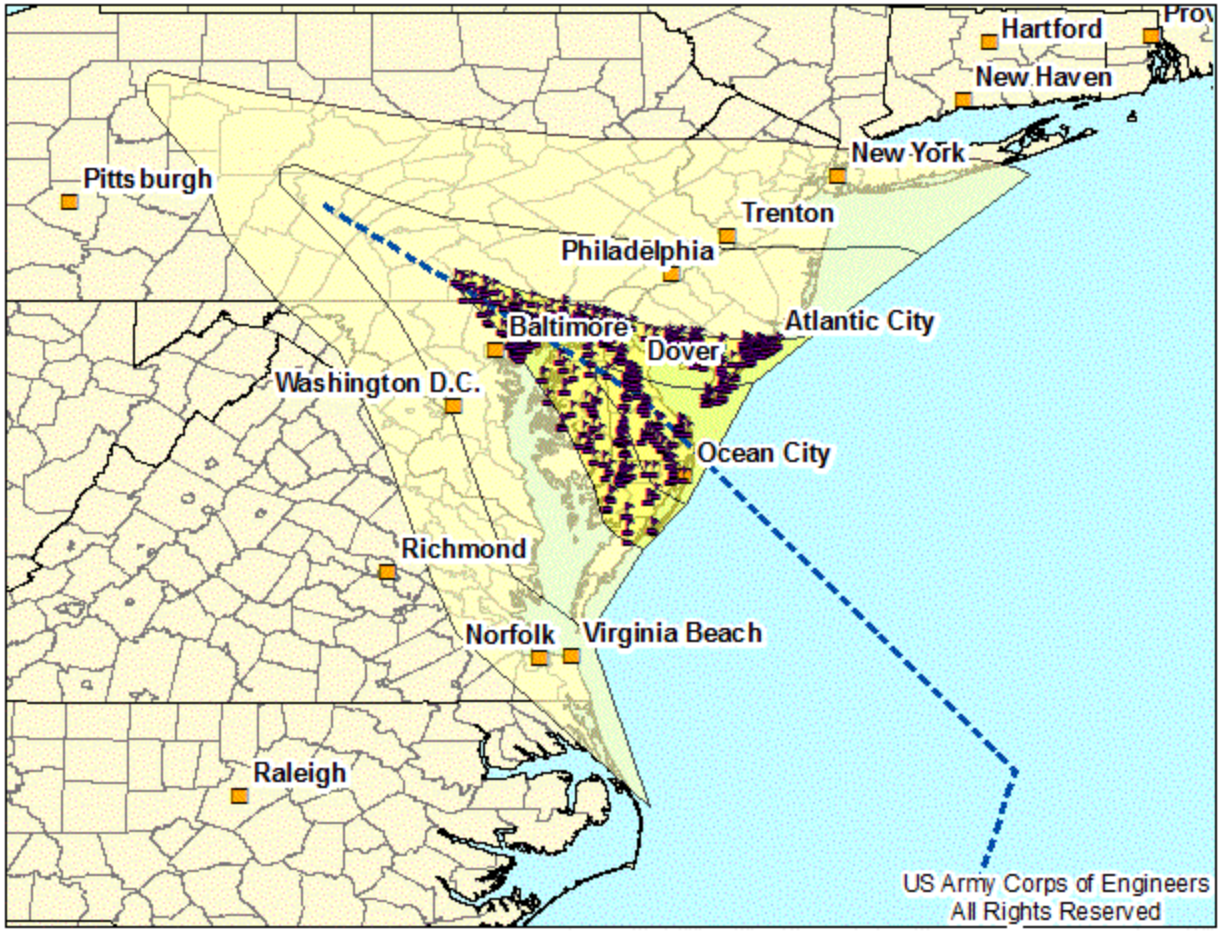
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Schools

Landfall Expected In About 84 Hours

For Planning Purposes Only!



Most Probable Landfall Schools Inside Hurricane Force Winds

Maryland - 187
Delaware - 131
New Jersey - 119
Pennsylvania - 20
Virginia - 6

Model results per County on following page

This model is based on a Category 1 storm making landfall coastal DE.

Schools
Forecast Track

Information provided on this page displays a Category 1 storm making landfall coastal DE. These projections are based on information from the NHC (1430 EDT 10/26/2012) forecast.

The number of schools included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Schools	
Generated By: Siemsen, Keown, LRL 1500 EDT 10/26/2012	
Sources: HURREVAC LRL-DEBRIS	Page 18 of 18